REMARKS

Claims 1-8 remain pending in this application. Claims 5-8 have been withdrawn as being directed to a non-elected invention.

Applicants acknowledge and appreciate the express indication in the Office Action that the drawings filed on 23 June 2006 are acceptable, the claim for priority and receipt of the priority documents has been acknowledged, and the documents cited in the information disclosure statements filed June 23, 2006, October 15, 2007, and April 2, 2008 have been considered.

Claims 1-4 have been rejected under 35 U.S.C. § 103(a) as obvious over Nomi et al. (JP Pub. No. 2000-256491) in view of Oka et al. (U.S. Patent No. 5,830,603). Nomi et al. is said to teach a polyolefin microporous membrane having a thickness of 10-100 microns (0020), a void content of 40-70% (0021), an air transmission rate of 100 to 1500 sec/100 cc (0022), and a piercing strength of 800 gf/25 microns (0023). The Office recognizes that Nomi et al. does not teach the recited maximum pore size or the ratio of maximum pore size to the average pore size of 1.00 to 1.40, but argues that these parameters are taught by Oka et al. that also teaches a polyolefin separator film that may have a thickness of 10 to 500 microns, preferably has a porosity of at least about 70%, and a pore size in the range of about 0.01 to about 20 microns (col. 4, lines 1-4). Oka et al. does teach that a film can be made with a porosity of at least 60% (col. 7, lines 4 and 5), and teaches an embodiment where the average pore size is 10 microns where the porosity is 80%, the film thickness is 100 microns, and there is no indication of maximum pore size. Oka et al. is said to teach that pore size should be controlled to prevent the cathode and anode from forming a short-circuit.

It is respectfully submitted that Oka et al. does not teach to control pore size in the context of a separator element taught by Nomi et al. or as claimed in the present application, does not teach that it is desirable to control the ratio of maximum pore size to average pore size, does not teach to control these parameters within the scope of the claimed invention, and does not appreciate that the recited combination of features contributes to a microporous membrane having a high permeability - i.e., good cycle performance, high withstand voltage (insulating performance) and excellent shutdown performance as described at page 2, line 9 to page 3, line 27 of the specification. The importance of observing the claimed parameters in combination to obtain a microporous membrane with high permeability characteristics is illustrated by the results of examples of the present invention (Examples 1-14) compared to membranes that do not meet all of the claimed parameters (Comparative Examples 1-6) - see Table 2 at page 46 of the specification.

The Office has recognized that Nomi et al. does not address, and is not concerned with, either maximum pore size, average pore size, or any relationship between these parameters. Oka et al. is relied upon as teaching pore size parameters (range of 0.01 to about 20 microns - col. 4, lines 3, 4) and an average pore size of not more than 50 microns, and preferably not more than 10 microns (col. 7, lines 14-18), but does not express any desired relationship between these two parameters. It also should be recognized that Oka et al. does not address the recited pore size parameters in the context of a microporous membrane having a combination of void content in the range of 30-60% and a membrane having a thickness of 1 to 30 microns. Accordingly, Oka et al. does not teach or suggest that the recited pore size parameters can or should

be adjusted to achieve the high permeability characteristics of the claimed polyolefin microporous membrane. Since the prior art does not recognize the result-dependent variables, those of skill in this art are not taught how to optimize these parameters to achieve the results of the present invention.

The Office correctly points out that Oka et al. teaches that average pore size should be reduced to preferably not more than 50 microns and more preferably not more than 10 microns in order to prevent the cathode and anode to form a short-circuit, and that average pore size is set so that particles of materials forming the electrodes in the battery will not pass through the porous film (col. 5, lines 14-21 and col. 7, lines 11-26). So the short-circuit disclosed in Oka et al. is generated by physically passing an electrode active material through a separator. The short circuit disclosed in Oka et al. is different from the “withstand voltage” property of the present invention since even a separator having a short interelectrode distance (i.e., distance between electrodes) does not cause an electrical short circuit in high voltage conditions since it has a high withstand voltage - see, e.g., page 3, lines 15-27 of the present specification. Since neither Nomi et al. nor Oka et al., individually or in combination, establish a prima facie case of obviousness of the claimed invention, this rejection should be withdrawn.

Prompt and favorable reconsideration is requested.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: December 18, 2009

By: Charles E Van Horn

Charles E. Van Horn
Reg. No. 40,266
(202) 408-4000